injected from the fuel injection valve of the fuel vaporizing section at least in twice per air intake thereby continuously supplying vaporized fuel.

Consequently, it is possible to use a CSD system from the engine start-up period which results in the reduction of the start-up time as well as the reduction of HC displacement at the start-up period.

WHAT IS CLAIMED IS:

1. A fuel supply system for an internal combustion engine comprising:

an air intake pipe for taking in air;

a throttle valve disposed in said air intake pipe for controlling an amount of said air;

a downstream fuel injection valve located near an air intake port of a cylinder of an internal combustion engine or inside a cylinder;

a bypass air intake passage for bypassing said throttle valve located upstream of said downstream fuel injection valve;

a fuel vaporizing section including an upstream fuel injection valve connected to said bypass air intake passage; and a heater for vaporizing fuel injected from said upstream fuel injection valve; said bypass air intake passage having a vaporized-fuel

branch section for channeling said vaporized fuel to said each cylinder, and a vaporized-fuel distribution passage extending from said vaporized-fuel branch section to an opening located in each air intake pipe located downstream of said throttle valve.

2. A fuel supply system for an internal combustion engine according to Claim 1, wherein said vaporized-fuel branch section located in said bypass air intake passage and said vaporized-fuel distribution passage are united with said air intake pipe.

3. A fuel supply system for an internal combustion engine according to Claim 1, wherein the cross-sectional area of said opening of said vaporized-fuel distribution passage is made smaller than the cross-sectional area of said vaporized-fuel distribution passage.

4. A fuel supply system for an internal combustion engine according to Claim 3, wherein an air flow is generated in the cylinder of an internal combustion engine.

5. A fuel supply system for an internal combustion engine according to Claim 1, wherein concerning the length of said bypass air intake passage, the shortest passage between those cylinders that have overlapping air intake timing is longer than the shortest passage

between those cylinders that do not have overlapping air intake timing.

6. A fuel supply system for an internal combustion engine according to Claim 1, wherein the cross-sectional area of said vaporized-fuel branch section which is connected to a plurality of cylinders is locally enlarged in the vicinity of the upstream cylinder and is larger than the above cross-sectional area.

7. A fuel supply system for an internal combustion engine according to Claim 1, wherein an orifice is disposed in said vaporized-fuel distribution passage which is connected to each cylinder, and the diameter of the orifice of at least one of said cylinders is different from that of other cylinders, and said orifice is located slightly upstream in said vaporized-fuel distribution passage.

8. A fuel supply system for an internal combustion engine according to Claims 1, wherein said bypass air intake passage is made of resin.

9. A fuel supply system for an internal combustion engine according to Claim 1, further comprising:

a bypass air volume control section disposed in said bypass air intake passage for controlling an amount of air flowing from upstream to downstream

through said air intake passage.

10. A fuel supply system for an internal combustion engine according to Claim 9, wherein said bypass air volume control section controls the amount of air necessary for atomizing fuel injected from an upstream fuel injection valve constituting said fuel vaporizing section and also controls the amount of air necessary for conveying vaporized fuel.

11. A fuel supply system for an internal combustion engine according to Claim 10, wherein said air volume control section also controls the amount of air so that the predetermined number of revolutions of the internal combustion engine can be attained.

12. A fuel supply system for an internal combustion engine according to Claim 1, wherein the necessary fuel for one combustion is injected from the upstream fuel injection valve constituting said fuel vaporizing section at least in twice per air intake process.

13. A fuel supply system for an internal combustion engine according to Claim 12, wherein fuel injection is performed according to a predetermined degree of the crank angle or according to a predetermined fuel injection time.

14. A fuel supply system for an internal

combustion engine according to Claim 13, wherein from a second fuel injection, fuel is injected according to a different degree of said crank angle or according to different fuel injection time.

15. A fuel supply system for an internal combustion engine according to Claim 12, wherein the number of said fuel injections is controlled to increase as the temperature of said internal combustion engine decreases.